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CIRCULAR No. 16

A Bean Disease Introduced in Diseased Seeds

BY

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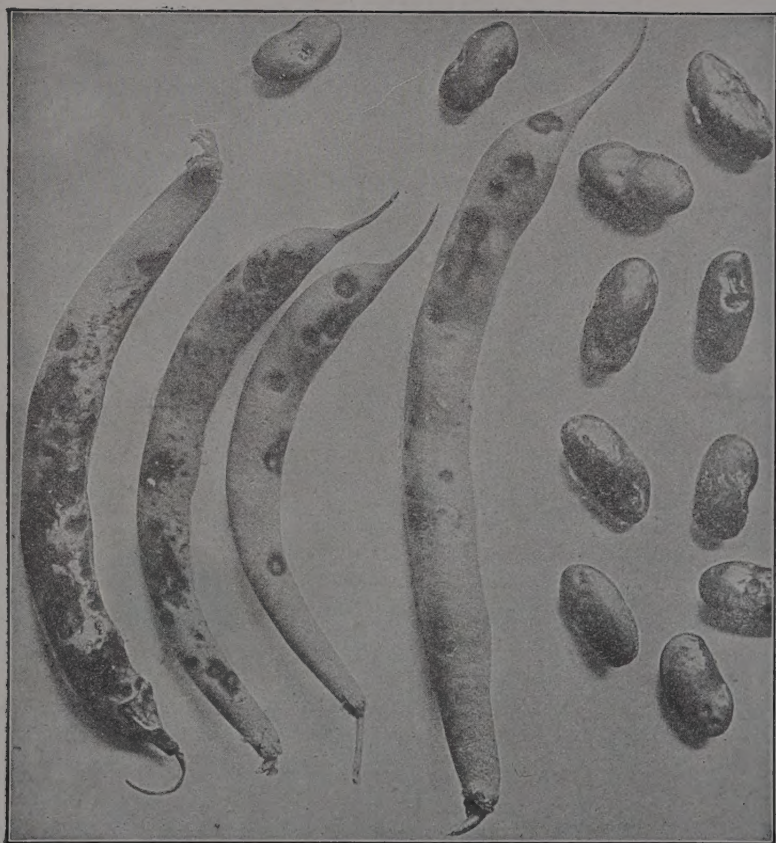


Fig. 1. Bean pods attacked by anthracnose. Diseased beans obtained from market.

CIRCULAR NO. 16.

A BEAN DISEASE INTRODUCED IN DISEASED SEEDS.

By H. GARMAN, ENTOMOLOGIST AND BOTANIST.

The demand for beans to plant has been so great during the past spring that it has brought into Kentucky inferior seeds that would not ordinarily be found here, and if offered for sale would not find a market. These seeds include with some good ones, others that are discolored, some that are wrinkled, while occasional lots show well defined dark spots on the surfaces of a part of the seeds.

The planting of such seeds is very likely to lead to disappointment. The worst affected seeds will not grow, of course, and this leads to a poor stand. But seeds of this sort that appear to be perfectly sound and germinate well may, notwithstanding, infect plants produced, and this has been the result of planting them in Kentucky this year. One of these lots of seeds is represented in the illustration accompanying this circular. The diseased pods of the figure were produced on plants grown from another lot of diseased seeds. They were slow in starting and the stand not perfect, but with some replanting the growth finally assumed a thrifty appearance and the plants blossomed freely. When the pods were of a size suitable for table use, the purple spots characteristic of the fungus disease known as Bean Anthracnose were observed on some of them, and later became rather frequent. The land on which the beans were grown had not been planted in such a

crop for twenty years, so it was evident that the disease was introduced with the seeds. Of the seeds left over from the planting twenty per cent were found diseased.

Anthracnose is a well known disease, the result of the attacks of a parasitic fungus often very destructive to both garden and field beans. It attacks pods, leaves and stems, but is not so often recognized on the two latter as when damaging the pods. The infection appears as minute purple dots, with an obscure darkening of the general green hue of the pod immediately about them. The affected surface becomes decidedly sunken as the dots increase in size, then the centers become black, and finally as the minute fruiting parts develop this gives way to a central gray or pink region. Spots may increase to a quarter of an inch in diameter, then merge with spots near-by and eventually affect much of the pod. The growing threads of the parasite push into the interior so far, after a time, as to reach the seeds, and leave purple or dusky marks on them. The fruiting bodies are microscopic in size and are produced in great numbers. When wet they adhere to whatever touches them, and are thus carried about by those working among the plants as well as by rain, and probably in dry weather by currents of air. Once started in a planting there is thus a prospect of further spread by these agencies.

The chief agency by which the disease is scattered over the country and perpetuated is undoubtedly the seeds. Most of those who have studied the ailment have been impressed with this fact. And while beans carrying the parasite are not in all cases recognizable, many such lots are, and these should never be planted unless first gone over and all seeds recognizable as diseased are thrown out and burned.

Treatment of suspected seeds with a fungicide has been advocated, and would probably be of more value if the fungus were completely exposed on the surface in all cases. Considering the fact that the parasite may be concealed within the seeds it is not calculated to be an entirely satisfactory treatment, tho it would disinfect the surface and thus, in con-

junction with other practices suggested, aid in getting a good crop. Formalin, as used for wheat smut, in the proportion of one pint in 30 gallons of water, is suggested as the disinfectant, the seeds in a sack to be immersed in the fluid for ten minutes, then to be placed in a heap under a tarpaulin or gunny sack for an hour, afterward to be spread out to dry.

Spraying the plants with Bordeaux Mixture is to be regarded as calculated only to hold the disease in check, and cannot be considered a remedy after they are thoroly infected. It should be applied early, as a preventive, and at intervals of a week or ten days. The 4-4-40 formula may be used in preparing the mixture. In small plantings in gardens it may be practicable to remove the spotted pods as they appear, if the number is not great, and thus keep the majority free. This should be attended to when the plants are dry, to avoid the possibility of spreading the disease by means of the conidia of the fungus which have adhered to the hands.

Seed Selection the Remedy.

After considering the disease from various angles, the matter of remedies thus comes at last to be largely a question of securing good seeds to plant. This is only one of several instances of the sort with which gardeners and farmers should be familiar. The sweet corn disease described in Circular No. 13 of this Station is another example. With all the care and good management possible in growing these plants, if this one essential has been neglected or overlooked, the labor and thoughtfulness have been defeated at the outset and would better have been expended on something else. Planting diseased seeds may appear to be economy, but in the end does not conserve the food supply.

Save your own seeds for planting, the very best you have. Plant on land not already infected. Practice rotation. Buy only after examining the stock of dealers. Insist that they give you germination percentages as required by the Kentucky seed law.

